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(54) Title: VENTED CLOSURE

(57) Abstract: A closure for a bottle. The closure includes a spout neck attached to the bottle and a cap rotatably positioned on the spout neck. The spout neck may have a sealing lip and the cap may have an internal vent and an internal body portion. The sealing lip of the spout neck and the body portion of the cap align to seal the bottle when the cap is in a first position. The sealing lip of the spout neck and the circular vent of the cap align so as to vent the bottle when the cap is turned to a second position.

VENTED CLOSURE

Technical Field

The present invention relates generally to a closure for a beverage bottle and more particularly relates to a closure that vents pressurized gases in a controlled manner while being opened.

Background of the Invention

Non-carbonated beverages such as waters, teas, juices, sports drinks, and the like may be sold in single serving and multiple serving plastic and glass bottles. Plastic bottles, which are more commonly used, may be made out of a PET (Polyethylene Terephthalate) resin. The beverage bottle may be enclosed by a standard screw-off cap or a closure with a pull-up spout that the consumer can open and close with his or her fingers. This type of packaging allows the consumer to open and close the beverage bottle as desired.

Another known type of bottle closure has a twist-top spout. Instead of pulling the spout up as in the pull-up closures, the consumer simply twists the spout. Examples of known twist-top closures are found in U.S. Design Patent Nos. 424,442 and 423,358.

Certain types of non-carbonated beverage bottles may be pressurized by injecting liquid nitrogen prior to capping. The nitrogen serves to make the bottle itself somewhat stiff. This bottle stiffness assists in labeling efficiency and in vending machine performance. The target internal bottle pressure after capping may be in the range of about ten (10) psi (about 0.7 kg/cm^2) to about twenty-five (25) psi (about 1.76 kg/cm^2). Known twist-top closures, however, generally are not designed to hold internal bottle pressures. For those closures that are intended or designed to be used with a pressurized bottle, one drawback with these closure designs is that there may be some spraying or squirting of the beverage contained in the bottle when the closure is first opened. This spraying or squirting of the beverage may be caused by the sudden release of the internal pressure when the closure is first opened.

Known bottle closures also may use an over-cap of some sort to protect the spout itself. The consumer, however, generally removes the over-cap before the consumer opens the spout. The over-cap therefore generally has not provided any protection from the spraying or squirting described above. Further,

while certain known over-caps produced by the applicants herein may be re-attachable, such re-attachable over-caps either have not used a frangible line or the frangible line is not readily visible to the consumer once broken. As such, the re-attachable over-caps may not provide immediate visual evidence of tampering.

What is needed, therefore, is a twist-top, pull-up, or other type of closure for a beverage bottle that holds pressure and provides controlled venting of this pressure during the opening of the bottle so as to eliminate beverage spraying or squirting. The closure and its use should be reasonably inexpensive and should not interfere with existing bottling equipment and methods.

Summary of the Invention

The present invention thus provides a closure for a bottle. The closure includes a spout neck attached to the bottle and a cap retractably positioned on the spout neck. The spout neck may have a sealing lip and the cap may have an internal vent and an internal body portion. The sealing lip of the spout neck and the body portion of the cap align to seal the bottle when the cap is in a first position. The sealing lip of the spout neck and the circular vent of the cap align so as to vent the bottle when the cap is moved to a second position.

Specific embodiments of the present invention include the spout neck and the cap being made from a substantially rigid thermoplastic. The spout neck may include an extended body portion extending adjacent to the sealing lip. The cap may include a circular rib positioned adjacent to the internal body portion such that the circular rib aligns with the extended body portion of the spout neck when the cap is in the first position and the second position and such that the circular rib aligns with the sealing lip of the spout neck when the cap is in a third position.

The circular vent may include a number of cut out areas and a number of gaps. The circular vent also may include a number of segmented grooves therein. The segmented grooves may include a series of bosses therein. The circular vent may have a predetermined diameter such that an air gap is created when the circular vent aligns with the sealing lip.

The sealing lip of the spout neck may include a spout aperture with a sealing cap positioned therein. The cap may include a top surface with a cap aperture therein. The top surface may include a circular wall surrounding the cap aperture. The circular wall and/or the spout neck may be sized such that the

circular wall and the sealing cap of the spout neck align to seal the cap aperture when the cap is in the first position and when the cap is moved to the second position. Specifically, the circular wall and the sealing cap of the spout neck align to seal the cap aperture when the cap is moved to the second position and the sealing lip of the spout neck and the circular vent of the cap align so as to vent the bottle. The circular wall and the sealing cap of the spout neck may align to open the cap aperture when the cap is moved to a third position.

The spout neck may include a base that is removably attachable to the bottle. The spout neck may include a number of recesses positioned on the base such that the cap may be positioned within one of the number of recesses. The spout neck may include a channel positioned thereon while the internal body portion of the cap may include a threaded segment thereon such that the segment engages the channel of the spout neck for movement therein.

The closure may further include an over-cap positioned over the cap. The over-cap may include a flexible thermoplastic. The over-cap may include an internal surface with a raised over-cap rib. The cap may include an exterior surface with a raised cap rib such that the raised over-cap rib and the raised cap rib align to secure the over-cap on the cap. The spout may include an over-cap recess for positioning the over-cap therein. The over-cap may include a frangible line. The frangible line may be positioned below the raised spout rib but above the over-cap recess when the over-cap is positioned therein such that the raised spout rib and the raised cap rib may align to secure the over-cap on the spout while the frangible line is visible.

The method of the present invention provides for venting the internal pressure of a bottle with a beverage therein. The bottle may have a twist-top closure with a spout neck and a twist cap. The spout neck and the twist cap may form an upper seal and a side seal. The method may include the steps of twisting the twist cap such that the side seal opens while the top seal remains closed, venting the internal pressure through the side seal, and twisting the twist cap further such that the side seal closes and the top seal opens to permit the beverage to flow out of the bottle.

Brief Description of the Drawings

Fig. 1 is an exploded view of the closure of the present invention

Fig. 2 is a top plan view of the spout neck and the base of the closure of Fig. 1.

Fig. 3 is a top plan view of the twist cap of the closure of Fig. 1.

Fig. 4 is a top plan view of the over-cap of the closure of Fig. 1.

Fig. 5 is a side cross-sectional view of the twist cap of the closure of Fig. 1.

Fig. 6 is a side cross-sectional view of the closure of Fig. 1 in the sealed position.

Fig. 7 is a partial side cross-sectional view of the closure of Fig. 1 in the sealed position with the gas stream shown.

Fig. 8 is a side cross-sectional view of the closure of Fig. 1 in the venting position.

Fig. 9 is a partial side cross-sectional view of the closure of Fig. 1 in the venting position with the gas stream shown.

Fig. 10 is a partial side cross-sectional view of the closure of Fig. 1 in the venting position with the gas stream shown.

Fig. 11 is a side cross-sectional view of the closure of Fig. 1 in the dispensing position.

Fig. 12 is a partial side cross-sectional view of the closure of Fig. 1 in the dispensing position with the gas stream shown.

Fig. 13 is a partial side cross-sectional view of the over-cap positioned on the spout base.

Fig. 14 is a partial side cross-sectional view of the over-cap being removed from the spout base.

Detailed Description of the Invention

Referring now in more detail to the drawings, in which like numerals referred to like parts throughout the several views, Figs. 1-5 show a bottle closure **100** of the present invention. The bottle closure **100** may be in the form of a twist-top closure as is described in more detail herein. The bottle closure **100** also may take the form of a pull-top closure or similar designs as are known to those skilled in the art. By way of example, U.S. Patent No. 6,135,329 shows a closure base that may be used with a twist-top or a pull- top closure.

The closure **100** may include a base **110**. The base **110** may be made from a substantially rigid thermoplastic such as polypropylene, polypropylene copolymers, high-density polyethylene, or similar types of materials. The base **110** may be made in an injection molding process or by similar manufacturing processes. The base **110** is sized to accommodate a conventional threaded neck **120** of a conventional beverage bottle **130**. The bottle **130** may be made from PET or similar types of flexible thermoplastic materials. The base **110** may include internal threads **140** to mate with the threaded neck **120** of the beverage bottle **130**. The base **110** also may include a ribbed portion **150** about its exterior so as to assist in removing the bottle closure **100** from the bottle **130** if desired. The dimensions of the closure **100** will depend upon the size of the bottle **130**. For example, the base **110** may have a diameter of about 1.25 inches (about 3.18 cm) so as to accommodate a conventional twenty (20) fluid ounce (about 0.6 liters) bottle **130**.

Positioned on a top portion **155** of the base **110** may be an annular rib **160**. The annular rib **160** may define two annular recesses, an over-cap recess **170** and a twist-top cap recess **180**. The over-cap recess **170** is sized to accommodate an over-cap as explained in more detail below. Likewise, the twist-top cap recess **180** is sized to accommodate a twist-top cap or other type of cap as described in more detail below.

Positioned on the top portion **155** of the base **110** also may be a spout neck **200**. The spout neck **200** may be integrally formed with the base **110** and may be made out of the same materials and through the same processes. The spout neck **200** may include a spout base **210** with one or more channels **215** formed therein. For use with the bottle **130** and the base **110** described above, the spout base **210** may be about 0.3 inches (about 0.76 cm) in length and about 0.6 inches (about 1.52 cm) in diameter. For use with a twist-top cap, the channel **215** may advance up the spout base **210** in a spiral fashion. The channel **215** may be similar to that disclosed in U.S. Patent No. 4,967,941.

The spout neck **200** also may include a venting area **220** positioned on top of the threaded base **210**. The venting area **220** may include a bottom flange **230** and a sealing lip **240**. An extended neck portion **250** may separate the bottom flange **230** and the sealing lip **240**. The bottom flange **230** may be about 0.05 inches (about 0.127 cm) in length and may have an upper diameter of about 0.5 inches (about 1.27 cm). The sealing lip **240** may be about 0.1 inches (about

0.25 cm) in length and may have a maximum diameter of about 0.55 inches (about 1.44 cm). The extended neck **250** portion may be a substantially smooth surface with a length of about 0.3 inches (about 0.76 cm) and a diameter of about 0.5 inches (about 1.27 cm).

Positioned within the sealing lip **240** may be an aperture **260**. The aperture **260** may have a diameter of about 0.5 inches (about 1.27 cm). Positioned within the aperture **260** may be a sealing cap **270**. The sealing cap **270** may be a raised circular structure. The sealing cap **270** may have a diameter of about 0.3 inches (about 0.76 cm) and a height of about 0.09 inches (about 0.23 cm) to about 0.10 inches (about 0.25 cm). The height of the sealing cap **270** is generally about 0.02 inches (about 0.05 cm) to about 0.03 inches (about 0.076 cm) longer than known devices produced by the applicants herein so as to accommodate the twist-top or other type of cap as described in more detail below, although other variations may be used. The sealing cap **270** may be attached to the spout neck **200** via a plurality of ribs **280** or by similar types of structures.

The bottle closure **100** also may include a twist-top cap **300**. The twist-top cap **300** may be a separate element from the spout neck **200**. The twist-top cap **300**, however, may be made from the same materials and through the same processes as the spout neck **200**, although high-density polyethylene is preferred. The twist-top cap **300** may be a substantially hollow structure. The twist-top cap **300** may include a base section **310**. The base section **310** may have an interior surface **320** and an exterior surface **330**. The base section **310** may have a wall thickness that is sized to fit and rotate within the twist-top cap recess **180** of the base **110**. The interior surface **320** of the base section **310** may have a height of about 0.3 inches (about 0.76 cm) while the exterior surface **330** may have a height of about 0.2 inches (about 0.5 cm).

The interior surface **320** of the base section **310** may have one or more thread segments **340** formed thereon. The thread segments **340** are designed to cooperate with the channel **215** of the spout base **210**. Specifically, the thread segments **340** fit within the channel **215** so as to elevate the twist-top cap **300** when twisting in one direction and return the twist-top cap **300** to its starting position when twisting in the opposite direction.

Positioned above the exterior surface **330** of the base section **310** may be a raised spout rib **350**. The raised spout rib **350** may be substantially oval in shape. The raised spout rib **350** may extend along the short ends or the

perigees **360** of the twist-top cap **300**. The raised spout rib **350** may be substantially eliminated along the long ends or the apogees **370** so as to form a smooth area **375** on both sides of the cap **300**. These smooth areas **375** along the apogees **370** may assist the consumer grasping and turning the twist-top cap **300**.

Positioned above the raised spout rib **350** on the twist-top cap **300** may be a cap body **380**. Similar to the raised spout rib **350**, the cap body **380** may be largely oval in shape. Positioned about the perigees **360** of the cap body **380** above the raised spout rib **350** may be a number of raised ribs **390**. The raised ribs **390** also may assist the consumer in opening the twist-top cap **300**. The area around the apogees **370** of the cap body **380** may be largely smooth and an extension of the smooth areas **375**.

Positioned on the cap body **380** may be a cap top **400**. The cap top **400** may be a substantially flat surface with an aperture **410** positioned therein. The aperture **410** may be sized to accommodate the sealing cap **270** of the spout neck **200**. The aperture **410** may be largely circular in shape. The aperture **410** may define a circular wall **440**. The circular wall **440** may have a length of about 0.06 inches (about 0.15 cm) to about 0.10 inches (about 0.25 cm) so as to cooperate with the sealing cap **270** of the spout neck **200**. It is understood that the length of the circular wall **440** and/or the length of the sealing cap **270** may be varied such that the two elements interact so as to form a seal of sufficient length as described in more detail below. The cap top **400** also may have arrow **405** or some other sort of indicia printed or formed thereon to indicate the twisting direction of the twist-top cap **300**.

Positioned above the interior surface **320** of the base section **310** of the twist-top cap **300** may be a circular rib **450**. The circular rib **450** may have a length of about 0.02 (about 0.05 cm) to about 0.05 inches (about 0.127 cm). The circular rib **450** may have a diameter to accommodate the elements of the spout neck **200** in the sealing and the venting positions as described in more detail below. Specifically, the circular rib **450** may be positioned against the bottom flange **230** of the spout neck **200** in the closed position and then may rise up the extended neck **250** portion as the twist-top cap **300** is turned.

Positioned above the circular rib **450** may be a first circular band **460**. The first circular band **460** may have a length of about 0.05 inches (about 0.127 cm) to about 0.06 inches (about 0.152 cm) and a diameter to accommodate the elements of the spout neck **200** in the sealing and the venting positions as

described in more detail below. Specifically, the first circular band **460** largely corresponds to the position of the extended neck **250** of the spout neck **200** in the closed position and then may rise up the extended neck **250** portion and the sealing lip **240** as the twist top cap **300** is turned.

Positioned above the first circular band **460** may be a circular vent **470**. The circular vent **470** may have a number of cut out areas **480** separated by a number of gaps **490**. The cut out areas **480** may include a series of segmented grooves **500** therein. The segmented grooves **500** may be in the form of a series of bosses within the cut out area **480**. The circular vent **470** may have a length of about 0.03 inches (about 0.076 cm) to about 0.04 inches (about 0.102 cm) and a diameter to accommodate the elements of the spout neck **200** in the sealing and the venting positions as described in more detail below. Specifically, the circular vent **470** may align substantially beneath the sealing lip **240** of the spout neck **200** when the twist-top cap **300** is in the closed position, with the sealing lip **240** as the twist-top cap **300** begins to turn, and above the sealing lip **240** when the twist-top cap **300** is fully turned. The cut out areas **480** may have a diameter of sufficient depth such that an air gap is created therebetween when the cut out areas **480** align with sealing lip **240**.

Positioned above the circular vent **470** may be a second circular band **520**. The second circular band **520** may have a length of about 0.07 inches (about 0.178 cm) to about 0.08 inches (about 0.203 cm) and about the same diameter as the first circular band **460**. The second circular band **520** may align substantially with the sealing lip **240** of the spout neck **200** when the twist-top cap **300** is in the closed position.

The bottle closure **100** also may include an over-cap **550**. The over-cap **550** may be made from a flexible thermoplastic such as polypropylene, polypropylene copolymers, high density polyethylene, The over-cap **550** may be made in an injection molding process. The over-cap **550** is designed to fit within the over-cap recess **170** of the base **110**.

As is shown in Figs. 13-14, the over-cap **550** may have a circumferential projection **570** positioned within the over-cap recess **170** and a main body **580** extending out of the over-cap recess **170**. Positioned slightly above the circumferential projection **570** may be a frangible line **590**. The frangible line **590** permits the separation of the main body **580** of the over-cap **550** from the circumferential projection **570**. The circumferential projection **570**

may still be visible when the over-cap **550** has been removed. The design of the over-cap **550** may be similar to that described in U.S. Patent No. 5,829,611.

The over-cap **550** also may have an interior surface **600**. The interior surface **600** may have a raised rib **610** therein. The raised rib **610** may encircle the interior surface **600**. The raised rib **610** is positioned such that it may catch the raised rib **350** of the twist-top cap **300** when the over-cap **550** is repositioned thereon. The over-cap **550** also may have an arrow **615** or some other type of indicia printed or formed thereon to indicate the twisting direction of the over-cap **550**.

In use, the bottle closure **100** is positioned upon the neck **120** of the beverage bottle **130**. As described above, the beverage bottle **120** may be slightly pressurized in the range of about ten (10) psi (about 0.7 kg/cm^2) to about twenty-five (25) psi (about 1.76 kg/cm^2). To open the bottle **130**, the consumer first removes the over-cap **550**. Removal of the over-cap **550** results in a break in the frangible line **590**. Once the over-cap **550** is removed, the consumer may still be able to see the circumferential projection **570** as an indication that the over-cap **550** has been removed.

The sealed position of the bottle **130** is shown in Figs. 6 and 7. Any pressurized gases within the bottle **130** may be sealed within the bottle closure **100** at two primary seal points. A first seal point **620** may exist between the sealing cap **270** of the spout neck **200** and the circular wall **440** of the aperture **410** of the twist-top cap **300**. The second seal point **630** may exist between the sealing lip **240** of the spout neck **200** and the second circular band **520** of the twist-top cap **300**.

The consumer may then twist the twist-top cap **300**. As the twist-top cap **300** is rotated and rises up the spout neck **200**, the circular vent **470** moves into alignment with the sealing lip **240** of the spout neck **200**. This orientation opens the second seal **630** and allows pressurized gases to pass through the cut out areas **480** or the segmented grooves **500** of the circular vent **570**. Figs. 8-10 show the bottle closure **100** in the venting position. The majority of the gas pressure may escape through the circular vent **470**. Although the gases may be vented through the circular vent **470**, the first seal **620** about the aperture **410** of the twist top cap **300** is still closed with respect to the sealing cap **270** and the circular wall **440**. The first seal remains closed due to the prolonged contact between the sealing cap **270** and the circular wall **440** due to the extended length

of the sealing cap **270**, the circular wall **440**, and/or both. As such, pressure only vents via the side of the bottle closure **100**.

As the consumer continues to turn the twist-top cap **300**, the circular rib **450** of the twist top cap **300** aligns with or below the sealing lip **240** of the spout neck **200**. This alignment effectively closes the circular vent **470** and forms a third seal **640**. As this point, the circular wall **440** about the aperture **410** of the twist-top cap **300** has cleared the sealing cap **270** of the spout neck **200** such that the first seal **620** is open. The beverage within the bottle **130** is now accessible via the bottle closure **100**. The circular vent **470** is closed, however, so as to prevent liquid from leaking therethrough and along the sides of the closure **100**. The consumer can thus enjoy the beverage within the bottle **130** via the closure **100**. The dispensing position is shown in Figs. 11 and 12.

Turning the twist-top cap **300** in the reverse direction may close the beverage bottle **100**. The sealing cap **270** of the spout neck **200** effectively fills the aperture **410** of the twist-top cap **300** so as to reform a substantially liquid tight seal. The bottle closure **100** also may form an airtight seal, but such may not be necessary once the initial pressure within the bottle **130** has been released.

The over-cap **550** also may be placed back onto the spout neck **200**. In doing so, the raised rib **610** of the over-cap **550** may catch on the raised rib **350** of the twist-top cap **300** so as to secure the over-cap **550** thereon. The over-cap **550** can be removed and replaced multiple times. Although the over-cap **550** may be removed multiple times, it is still apparent that the frangible line **590** has been broken. The use of the over-cap **550** thus provides for easy access to the beverage and also provides sanitary access. The use of the over-cap **550** in this manner also acts as a further means for preventing the spraying of the liquid therein.

CLAIMS

We claim:

1. A closure for a bottle, comprising:
a spout neck attached to said bottle;
said spout neck comprising a sealing lip; and
a cap positioned for movement on said spout neck;
said cap comprising an internal vent and an internal body portion such that said sealing lip of said spout neck and said body portion of said cap align to seal said bottle when said cap is in a first position and such that said sealing lip of said spout neck and said circular vent of said cap align so as to vent said bottle when said cap is moved to a second position.

2. The closure for a bottle of claim 1, wherein said cap comprises a twist cap rotatably positioned on said spout neck.

3. The closure for a bottle of claim 1, wherein said spout neck and said cap comprise a substantially rigid thermoplastic.

4. The closure for a bottle of claim 1, wherein said spout neck comprises a base such that said base is removably attachable to said bottle.

5. The closure for a bottle of claim 4, wherein said spout neck comprises a plurality of recesses positioned on said base such that said cap may be positioned within one of said plurality of recesses.

6. The closure for a bottle of claim 1, wherein said spout neck comprises a channel positioned thereon.

7. The closure for a bottle of claim 6, wherein said internal body portion of said cap comprises a threaded segment thereon such that said segment engages said channel of said spout neck for movement therein.

8. The closure for a bottle of claim 1, wherein said spout neck comprises an extended body portion extending adjacent to said sealing lip.

9. The closure for a bottle of claim 8, wherein said cap comprises a circular rib positioned adjacent to said internal body portion such that said circular rib aligns with said extended body portion of said spout neck when said cap is in said first position and said second position and such that said circular rib aligns with said sealing lip of said spout neck when said cap is in a third position.

10. The closure for a bottle of claim 1, wherein said circular vent comprises a predetermined diameter such that an air gap is created therebetween when said circular vent aligns with said sealing lip.

11. The closure for a bottle of claim 1, wherein said circular vent comprises a plurality of cut out areas therein.

12. The closure for a bottle of claim 11, wherein said circular vent comprises a plurality of gaps positioned among said plurality of cut out areas.

13. The closure for a bottle of claim 12, wherein said circular vent comprises a plurality of segmented grooves therein.

14. The closure for a bottle of claim 13, wherein said plurality of segmented grooves comprises a plurality of bosses therein.

15. The closure for a bottle of claim 1, wherein said sealing lip of said spout neck comprises a spout aperture therein.

16. The closure for a bottle of claim 15, wherein said spout aperture comprises a sealing cap positioned therein.

17. The closure for a bottle of claim 16, wherein said cap comprises a top surface and wherein said top surface comprises a cap aperture therein.

18. The closure for a bottle of claim 17, wherein said cap aperture comprises a circular wall and wherein said circular wall is sized such that said circular wall and said sealing cap of said spout neck align to seal said cap aperture when said cap is in said first position and when said twist cap is moved to said second position.

19. The closure for a bottle of claim 17, wherein said cap aperture comprises a circular wall and wherein said sealing cap is sized such that said circular wall and said sealing cap of said spout neck align to seal said cap aperture when said cap is in said first position and when said twist cap is moved to said second position.

20. The closure for a bottle of claim 17, wherein said cap aperture comprises a circular wall and wherein said circular wall and said sealing cap are sized such that said circular wall and said sealing cap of said spout neck align to seal said cap aperture when said cap is moved to said second position and said sealing lip of said spout neck and said circular vent of said cap align so as to vent said bottle.

21. The closure for a bottle of claim 20, wherein said circular wall and said sealing cap of said spout neck align to open said cap aperture when said cap is moved to a third position.

22. The closure for a bottle of claim 1, further comprising an over-cap positioned over said cap.

23. The closure for a bottle of claim 22, wherein said over-cap comprises a flexible thermoplastic.

24. The closure for a bottle of claim 23, wherein said over-cap comprises an internal surface and wherein said interior surface comprises a raised over-cap rib.

25. The closure for a bottle of claim 24, wherein said cap comprises an exterior surface and wherein said exterior surface comprises a raised cap rib such that said raised over-cap rib and said raised cap rib align to secure said over-cap on said cap.

26. A closure for a bottle, comprising:

a spout;

said spout comprising an exterior surface and wherein said exterior surface comprises a raised spout rib; and

a over-cap positioned on said spout;

said over-cap comprising an interior surface and wherein said interior surface comprises a raised cap rib such that said raised spout rib and said raised cap rib align to secure said over-cap on said spout.

27. The closure for a bottle of claim 26, wherein said spout comprises a spout neck and a twist-top cap.

28. The closure for a bottle of claim 27, wherein said spout comprises an over-cap recess for positioning said over-cap therein.

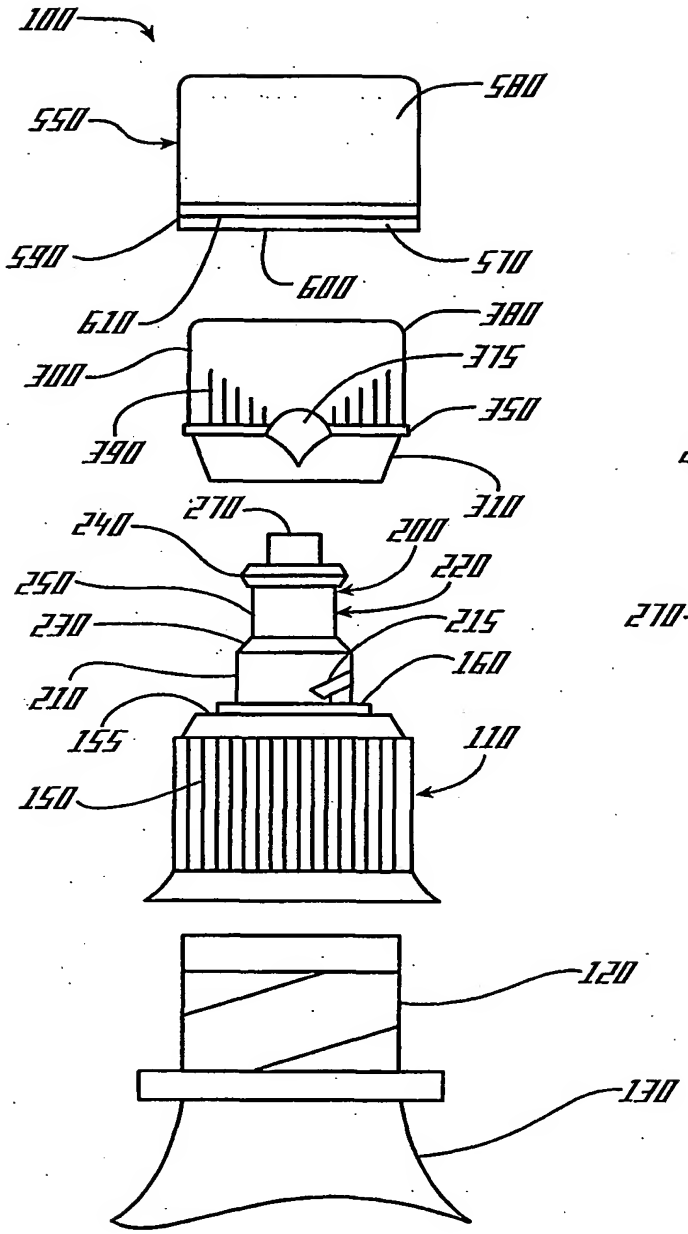
29. The closure for a bottle of claim 28, wherein said over-cap comprises a frangible line, said frangible line positioned below said raised spout rib but above said over-cap recess when said over-cap is positioned therein such that said raised spout rib and said raised cap rib align to secure said over-cap on said spout while said frangible line is visible.

30. A method for venting an internal pressure of a bottle with a beverage therein, said bottle having a twist-top closure with a spout neck and a twist cap, said spout neck and said twist cap forming an upper seal and a side seal, said method comprising the steps of:

twisting said twist cap such that said side seal opens while said top seal remains closed;

venting said internal pressure through said side seal; and

twisting said twist cap further such that said side seal closes and said top seal opens to permit said beverage to flow out of said bottle.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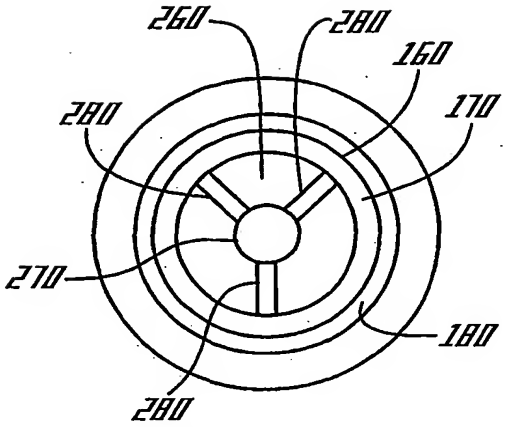
120
130

Fig. 1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180
280

Fig. 2

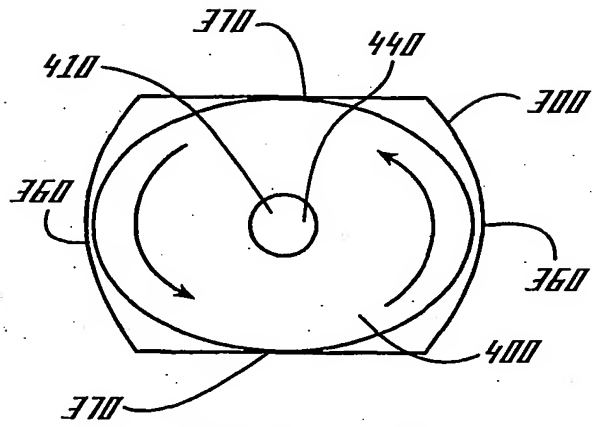
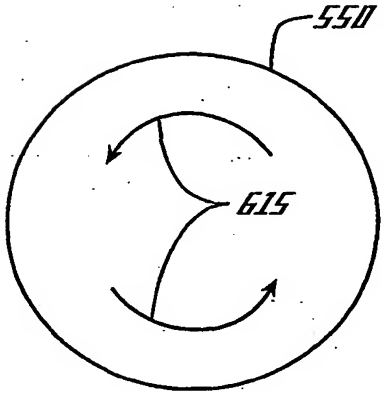


Fig. 3



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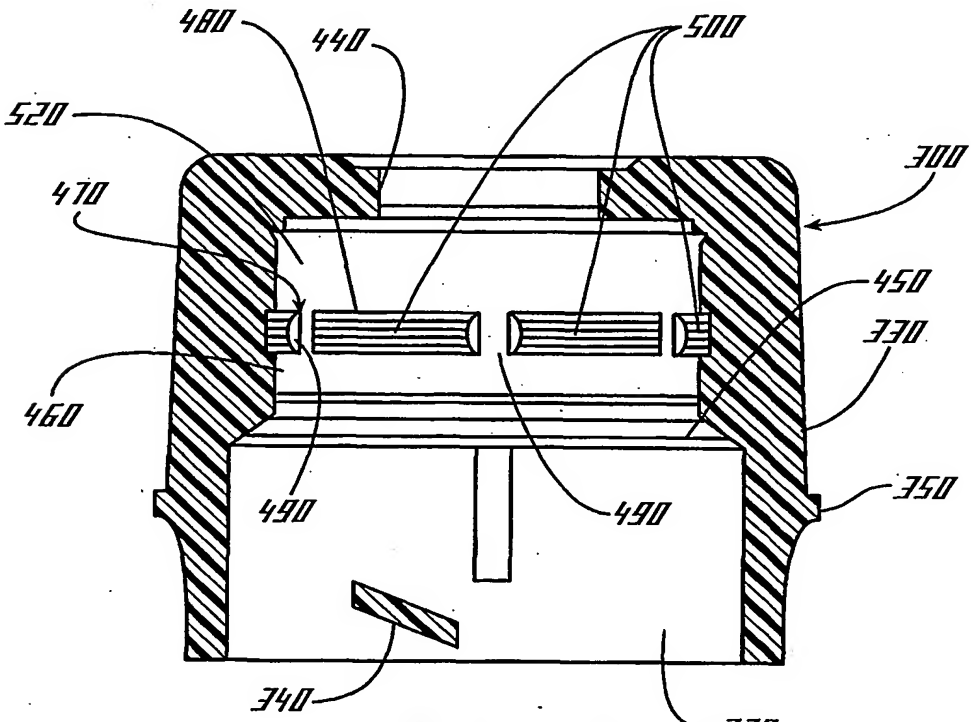

Fig. 5

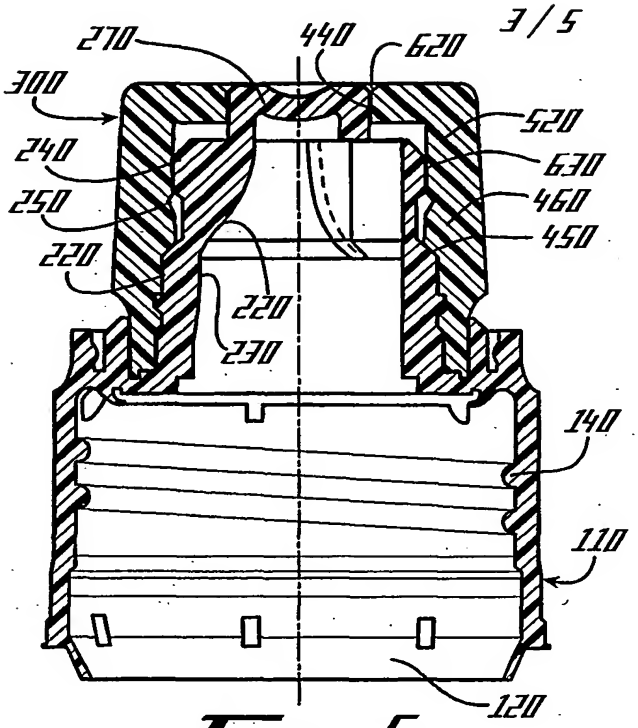

Fig. 6

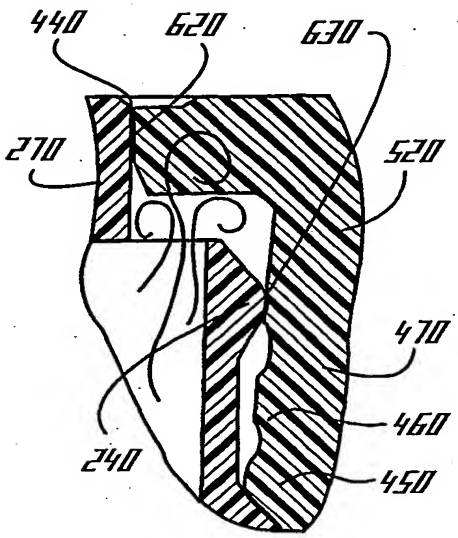

Fig. 7

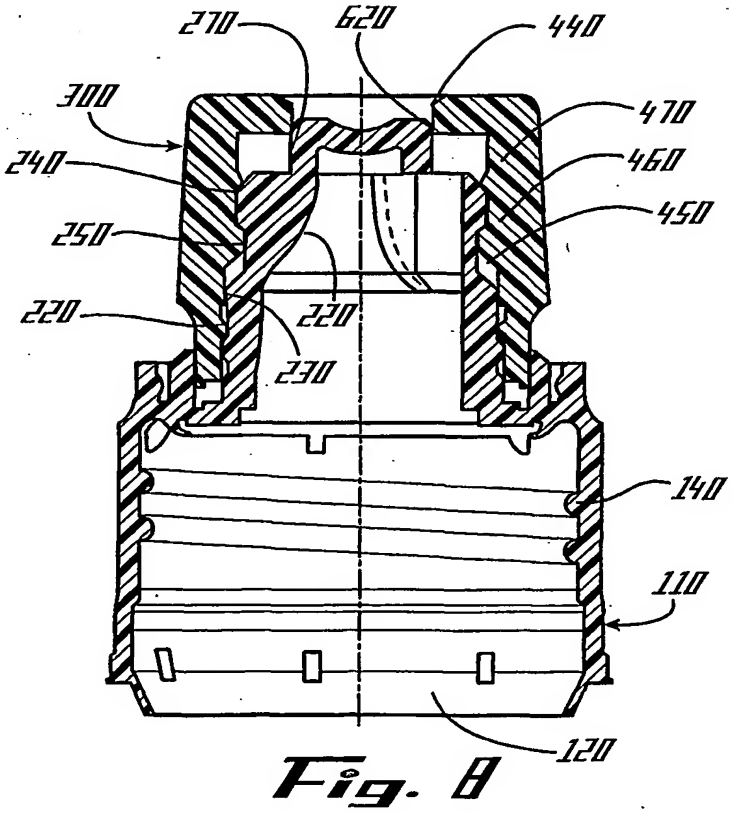

Fig. 8

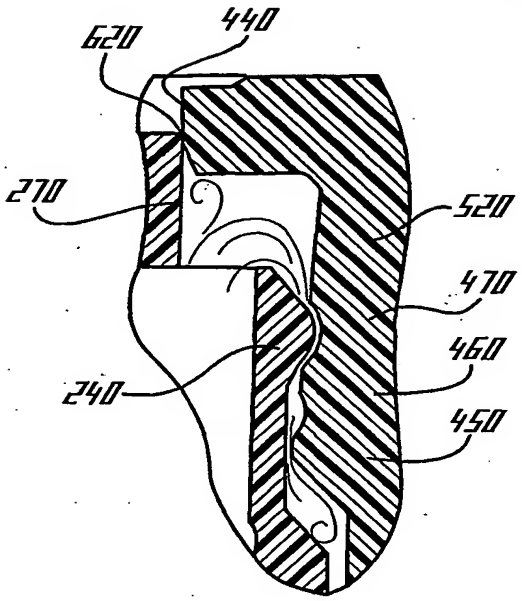

Fig. 9

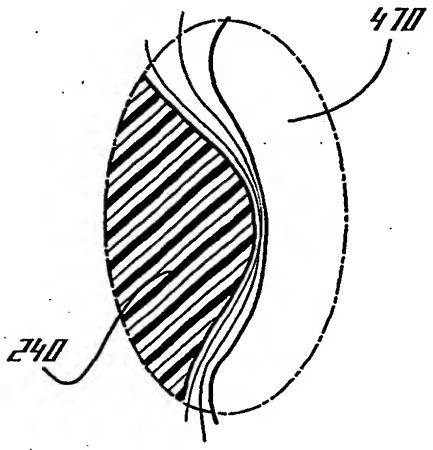

Fig. 10

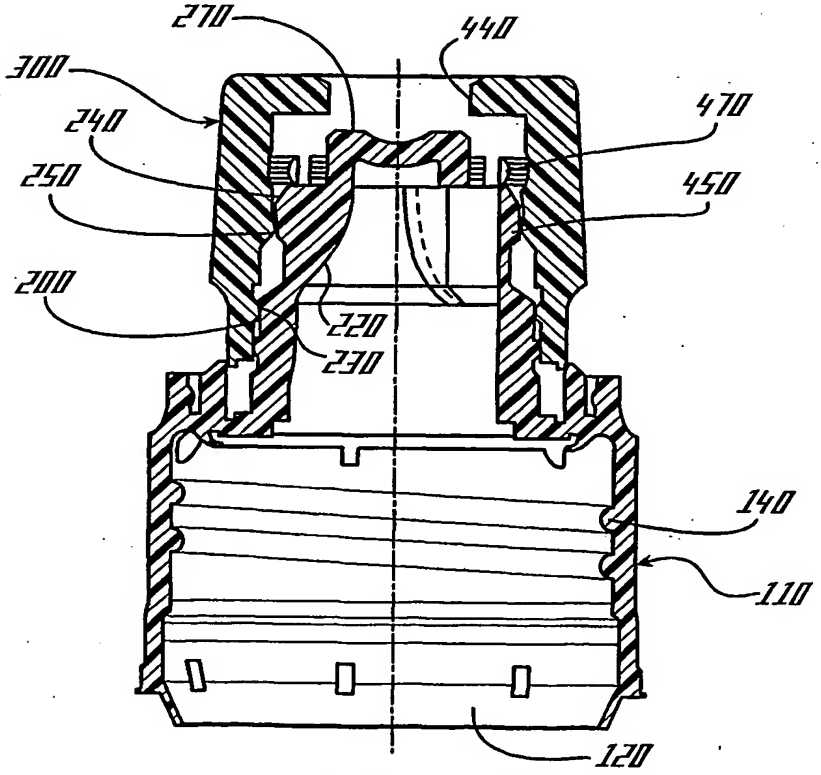

Fig. 11

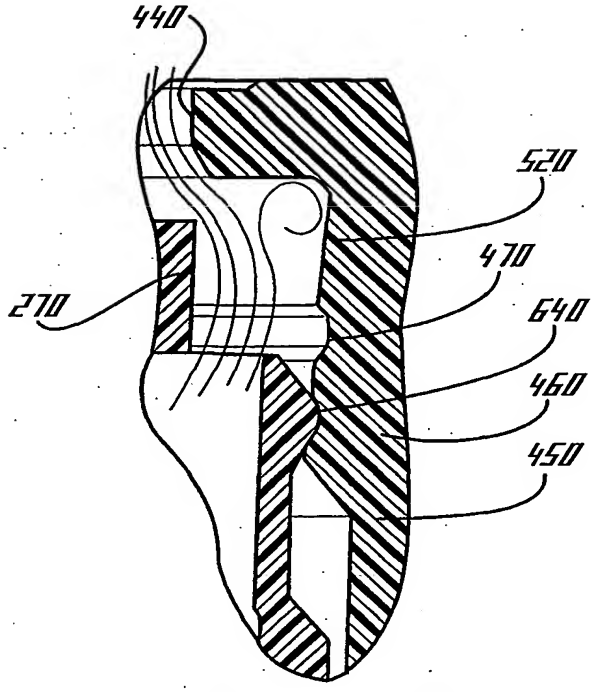

Fig. 12

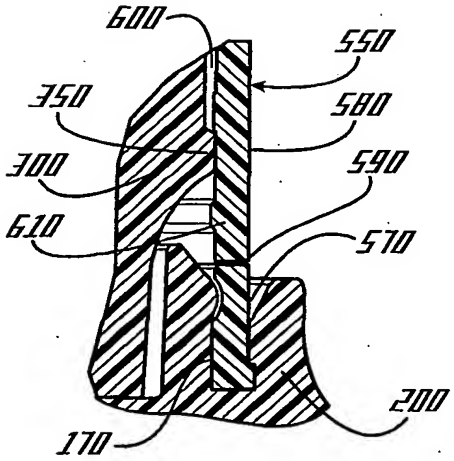

Fig. 13

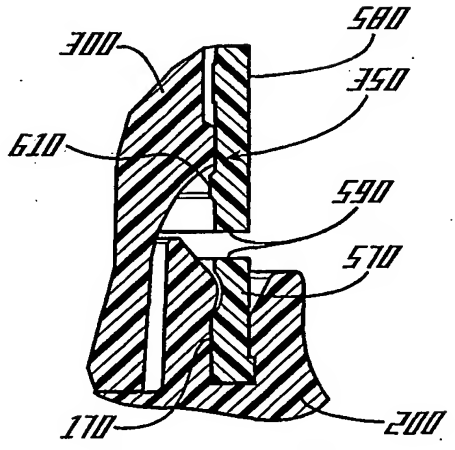

Fig. 14